1. A method of accurately representing, for computational processing, a desired value among a pressure range of values of pressure to be applied to a wafer in chemical mechanical polishing, comprising the operations of:

dividing the pressure range by the value of a component resolution to define scale portions of the pressure range;

generating a first output signal to identify one of the scale portions that includes the desired value; and

generating a second output signal to identify a set point that defines the requested value in the identified scale portion.

2. A method as recited in claim 1, wherein the component resolution is the resolution of a digital device that outputs data representing the identity of the one of the scale portions and of the set point.

3. A method as recited in claim 1, wherein the operation of generating the first output signal comprises:

converting the identified scale portion to a count value of resolution units;

dividing a range of the first output signal by the component resolution to define a first signal conversion factor; and

converting the identified scale portion in resolution units to the first output signal by multiplying the count value of the identified scale portion times the first signal conversion factor.

4. A method as recited in claim 1, wherein the operation of generating the second output signal comprises:

converting the identified set point to a count value of resolution units;

dividing a range of the first output signal by the component resolution to define a second signal conversion factor; and

converting the identified set point in resolution units to the second output signal by multiplying the count value of the identified set point times the second signal conversion factor.

5. A method of reducing quantization error in a computation of chemical mechanical polishing parameter, comprising the operations of:

defining synchronization data for synchronization operations of first and second digital processors, the synchronization data defining a computational resolution, a set of values of the parameter to be used in computations, a set of values of output parameter data for communications between the first and second digital processors, a scale data conversion function that defines a relationship between the parameter and each one of a plurality of scales into which the set of values of the parameter is divided; a set point data conversion function that defines a relationship between a range of values of the parameter in a particular one of the scales and a set point that defines a required value of the parameter in the particular scale;

performing a first conversion operation in the first processor and based on the synchronization data, the first conversion operation being performed on a required value of

the parameter, the first conversion operation converting the required value of the parameter to first output parameter digital data representing a particular one of the scales;

performing a second conversion operation in the first digital processor and based on the synchronization data, the second conversion operation being performed on the required value of the parameter to convert the required value to second output parameter digital data representing the set point that defines the required value of the parameter in the particular scale;

performing a third conversion operation in the second processor and based on the synchronization data, the third conversion operation being performed on the first output parameter digital data to convert the first output parameter digital data to scale data representing the particular one of the scales; and

performing a fourth conversion operation in the second processor and based on the synchronization data, the fourth conversion operation being performed on the second output parameter digital data to convert the second output parameter digital data to digital data representing the required value of the parameter.

6. A method as recited in claim 5, wherein the first conversion operation includes dividing the computational resolution into the highest value of the set of values of parameter to define the scale data conversion function in terms of a number of the plurality of the scales, each of the scales having a range within the set of values; each range being of equal-value, and wherein the first conversion operation further includes identifying which of the scales corresponds to the required value of the parameter.

7. A method as recited in claim 6, wherein the set point data conversion function is based on the ratio of the required value of the parameter to the range of values of the parameter in the particular scale.

8. A method as recited in claim 6, wherein the synchronization data further includes a definition of a voltage conversion value in terms of numbers of counts per voltage value and wherein the third conversion operation includes multiplying a voltage value of the first output parameter digital data by the voltage conversion value to convert the first output parameter digital data to digital count data, and wherein the synchronization data further includes a definition of a count conversion value in terms of numbers of counts per particular ones of the scales, and wherein the third conversion operation includes multiplying the digital count data value of the first output parameter digital data by the count conversion value to convert the digital count data to the scale data.

9. A method as recited in claim 6, wherein the set point data conversion function further includes a definition of a voltage conversion value in terms of numbers of counts per voltage value, and wherein the fourth conversion operation includes multiplying a voltage value of the second output parameter digital data by the voltage conversion value to convert the second output parameter digital data to digital count data, and wherein the set point data conversion function further includes a definition of a count conversion value in terms of numbers of counts corresponding to the required parameter in the particular one of the scales.

10. A method of reducing quantization error in specifying a chemical mechanical polishing parameter in which a computational resolution is to be used in processing a required value of the parameter to obtain a computed value of the parameter, comprising the operations of:

defining a relatively average value of the computational resolution;

defining a set of values of the parameter, the set containing possible values of the parameter, the set of possible parameter values including the required value of the parameter;

dividing the highest value of the parameter of the set by the relatively average value of the computational resolution to obtain a series of parameter scales of the set, the parameter scales representing uniformly increasing possible values of the parameter, the scales having equal ranges of value of the parameter each of which ranges has a value in excess of the value of the required parameter;

providing a different first identifier for each of the scales of the parameter, the number of different first identifiers being equal to the value of the computational resolution; and

specifying the required value of the parameter by providing a different second identifier to indicate a set point value within any specific one of the scales, the set point corresponding to any particular parameter value, the number of different second identifiers being equal to the value of the computational resolution.

11. A method as recited in claim 10, wherein the specific required value of the parameter is to be communicated to a processor for processing the required value of the parameter, comprising the further operations of:

generating a two-part output representing the required value of the parameter, the output including first data representing the first identifier that corresponds to the specific one of the scales that includes the required value of the parameter, the output further including second data representing the second identifier that corresponds to the required value of the parameter within the specific one of the scales.

12. A method as recited in claim 11, the method further comprising the operation of:

receiving the first and second data of the output; and

converting the output to the exact amount of the required value of the parameter by selecting one of the parameter scales corresponding to the first identifier, and by selecting a value within the selected parameter scale corresponding to the second identifier.

13. A method as recited in claim 10, wherein the operation of defining the relatively average value of the computational resolution defines a resolution not higher than 10 bits; the method further comprising the operation of:

converting the two-part output to a force to be applied to a wafer, the value of the force corresponding to the required value of the pressure.

14. A method of reducing quantization error in an analog computation for converting an input representing force in terms of units of force to an analog force output representing force in terms of a force actuator signal, comprising the operations of:

converting the input to two analog force signals and a plurality of digital logic signals, the analog force signals representing the boundaries of a range of force actuator signals to be input to a force actuator, the range including a force actuator signal having a value corresponding to the value of the force in force units; the digital logic signals having a resolution less than or equal to 12 bits, the digital logic signals representing the force actuator signals in the range having the value corresponding to the value of the force in force units;

based on the resolution of the digital logic signals, converting a difference between the two analog force signals to an analog force increment signal;

based on logic defined by the digital logic signals, converting the analog force increment signal to an analog force set point signal; and

adding one of the analog force signals to the analog force set point signal to determine the value of the force actuator signal.

15. A method as recited in claim 14, the operation of converting the difference comprising the operations of:

determining the difference between the two analog force signals to output an analog range signal representing the range of the force actuator signals; and

dividing the analog range signal by the resolution of the digital signals to output the analog force increment signal.

16. A method as recited in claim 14, the operation of converting the analog force increment signal comprising the operations of:

using the digital logic signals to select an analog logical signal; and

multiplying the analog force increment signal by the logical analog signal to output the analog force set point signal.

17. A method as recited in claim 14, wherein each of the force actuator signal, the two analog force signals, the analog force increment signal, and the analog force set point signal is a voltage signal.